SEQUENCE LISTING

<110> University Gent

<120> Ostertagia vaccine

<130> 2002-015

<150> US 10/243,319
<151> 2002-09-13

<160> 27

<170> PatentIn version 3.2

<210> 1
<211> 828
<212> DNA
<213> Ostertagia ostertagi

<220>
<221> CDS
<222> (11)..(721)

<400> 1

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gcagctcggt atg cag gca cta atc ggt att gct gcc cta tac ctg gtg        49
          Met Gln Ala Leu Ile Gly Ile Ala Ala Leu Tyr Leu Val
          1               5                  10

ctg gtg aca tca aat acc gaa gca ggt ttt tgc tgc cca gca gat cta        97
Leu Val Thr Ser Asn Thr Glu Ala Gly Phe Cys Cys Pro Ala Asp Leu
    15                  20                  25

aac caa act gat gag gca aga maa atc ttc ctc gat ttt cac aat caa       145
Asn Gln Thr Asp Glu Ala Arg Xaa Ile Phe Leu Asp Phe His Asn Gln
30                  35                  40                  45

gtt cgc cgt gat ata gca ggt gca agc ccg ttg ctc aac ctc acc gga       193
Val Arg Arg Asp Ile Ala Gly Ala Ser Pro Leu Leu Asn Leu Thr Gly
                50                  55                  60

gct gtt car atg cga aat gtt ctc ggt cca gct aag aac atg tac aga       241
Ala Val Gln Met Arg Asn Val Leu Gly Pro Ala Lys Asn Met Tyr Arg
            65                  70                  75

atg gac tgg gac tgc aat ctg gaa gca aaa gca aag gca atg att tgg       289
Met Asp Trp Asp Cys Asn Leu Glu Ala Lys Ala Lys Ala Met Ile Trp
        80                  85                  90

cca tgc act acg cct ctg cca ata gac acg agt att cca caa aat ctc       337
Pro Cys Thr Thr Pro Leu Pro Ile Asp Thr Ser Ile Pro Gln Asn Leu
    95                  100                 105

gct car tgg cta ctt ttc caa aac agt cag gaa amt gaa gtg ttg acg       385
Ala Gln Trp Leu Leu Phe Gln Asn Ser Gln Glu Xaa Glu Val Leu Thr
110                 115                 120                 125
```

```
caa acg ccc tgg tct tgg gta acc gca tca cta cga aat ctt caa cct      433
Gln Thr Pro Trp Ser Trp Val Thr Ala Ser Leu Arg Asn Leu Gln Pro
                130                 135                 140

gat aca gaa gct aac att tat aac tgg caa att aga cca cta tcc aac      481
Asp Thr Glu Ala Asn Ile Tyr Asn Trp Gln Ile Arg Pro Leu Ser Asn
            145                 150                 155

att gcg aac tgg caa aac cta aaa gtt gga tgt gct cac aaa gtg tgc      529
Ile Ala Asn Trp Gln Asn Leu Lys Val Gly Cys Ala His Lys Val Cys
        160                 165                 170

aaa ttc ccc acc ggg aca aat atg gtt gtg tct tgc gct tat ggc ggc      577
Lys Phe Pro Thr Gly Thr Asn Met Val Val Ser Cys Ala Tyr Gly Gly
    175                 180                 185

gaa gta ctc caa gat aac gaa gtt gta tgg gac aag gga cca act tgc      625
Glu Val Leu Gln Asp Asn Glu Val Val Trp Asp Lys Gly Pro Thr Cys
190                 195                 200                 205

atg tgc aat gct tat ccc aac tcg ttc tgc tgc aac aat ctg tgt gac      673
Met Cys Asn Ala Tyr Pro Asn Ser Phe Cys Cys Asn Asn Leu Cys Asp
                210                 215                 220

aca ata gct gct gcg aca ctt cgc aag cag cct tgt aaa tcg act tga      721
Thr Ile Ala Ala Ala Thr Leu Arg Lys Gln Pro Cys Lys Ser Thr
            225                 230                 235

agcgaaaagg cgttggtgat gtcccgaaga gaacggaagt gatcacatca cagtatccca    781

taatgtcgtt catcataata aacgcacttc tctgaaaaaa aaaaaaa                  828
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<210> 2
<211> 236
<212> PRT
<213> Ostertagia ostertagi

<220>
<221> misc_feature
<222> (37)..(37)
<223> The 'Xaa' at location 37 stands for Lys, or Gln.

<220>
<221> misc_feature
<222> (121)..(121)
<223> The 'Xaa' at location 121 stands for Asn, or Thr.

<400> 2

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Met Gln Ala Leu Ile Gly Ile Ala Ala Leu Tyr Leu Val Leu Val Thr
1               5                  10                  15

Ser Asn Thr Glu Ala Gly Phe Cys Cys Pro Ala Asp Leu Asn Gln Thr
            20                  25                  30

Asp Glu Ala Arg Xaa Ile Phe Leu Asp Phe His Asn Gln Val Arg Arg
        35                  40                  45
```

```
Asp Ile Ala Gly Ala Ser Pro Leu Leu Asn Leu Thr Gly Ala Val Gln
    50                  55                  60

Met Arg Asn Val Leu Gly Pro Ala Lys Asn Met Tyr Arg Met Asp Trp
65                  70                  75                  80

Asp Cys Asn Leu Glu Ala Lys Ala Lys Ala Met Ile Trp Pro Cys Thr
                85                  90                  95

Thr Pro Leu Pro Ile Asp Thr Ser Ile Pro Gln Asn Leu Ala Gln Trp
            100                 105                 110

Leu Leu Phe Gln Asn Ser Gln Glu Xaa Glu Val Leu Thr Gln Thr Pro
        115                 120                 125

Trp Ser Trp Val Thr Ala Ser Leu Arg Asn Leu Gln Pro Asp Thr Glu
    130                 135                 140

Ala Asn Ile Tyr Asn Trp Gln Ile Arg Pro Leu Ser Asn Ile Ala Asn
145                 150                 155                 160

Trp Gln Asn Leu Lys Val Gly Cys Ala His Lys Val Cys Lys Phe Pro
                165                 170                 175

Thr Gly Thr Asn Met Val Val Ser Cys Ala Tyr Gly Gly Glu Val Leu
            180                 185                 190

Gln Asp Asn Glu Val Val Trp Asp Lys Gly Pro Thr Cys Met Cys Asn
        195                 200                 205

Ala Tyr Pro Asn Ser Phe Cys Cys Asn Asn Leu Cys Asp Thr Ile Ala
    210                 215                 220

Ala Ala Thr Leu Arg Lys Gln Pro Cys Lys Ser Thr
225                 230                 235
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<210> 3
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<213> Ostertagia ostertagi

<220>
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<220>
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<222> (10)..(10)
<223> n is a, c, g, or t

<220>
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<222> (16)..(16)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (82)..(82)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (226)..(226)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (240)..(240)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (248)..(248)
<223> n is a, c, g, or t

<400> 3

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gc ggc cgc gnc gac cnt gtg atc agc atc atg gct ctg tgg ccc gtg          47
   Gly Arg Xaa Asp Xaa Val Ile Ser Ile Met Ala Leu Trp Pro Val
   1               5                  10                  15

gac cgt ttc gag cgc atg ctg gaa gag ccg ttc ang cgt gtg gat cgt          95
Asp Arg Phe Glu Arg Met Leu Glu Glu Pro Phe Xaa Arg Val Asp Arg
                20                  25                  30

ttc tgc ccg atg aga gat gcg gac tgg atg agc cgt cag att atg ccc         143
Phe Cys Pro Met Arg Asp Ala Asp Trp Met Ser Arg Gln Ile Met Pro
            35                  40                  45

tac tgg aga gat gcc gat cac tct gtg ctt cat gtg gga aat caa aca         191
Tyr Trp Arg Asp Ala Asp His Ser Val Leu His Val Gly Asn Gln Thr
        50                  55                  60

aag gat gtc gtg aat gac gag aag aaa ttc gca gnc gct ttg gat gtg         239
Lys Asp Val Val Asn Asp Glu Lys Lys Phe Ala Xaa Ala Leu Asp Val
    65                  70                  75

nca cac ttn agg cca gaa gag ttg aag gta caa ttg gaa gtg acg             284
Xaa His Xaa Arg Pro Glu Glu Leu Lys Val Gln Leu Glu Val Thr
80                  85                  90

tgaccttaca atcgaaggac at                                               306
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<210> 4
<211> 94
<212> PRT
<213> Ostertagia ostertagi

<220>
<221> misc_feature
<222> (3)..(3)
<223> The 'Xaa' at location 3 stands for Asp, Gly, Ala, or Val.

<220>
<221> misc_feature
<222> (5)..(5)
<223> The 'Xaa' at location 5 stands for His, Arg, Pro, or Leu.

<220>
<221> misc_feature
<222> (27)..(27)
<223> The 'Xaa' at location 27 stands for Lys, Arg, Thr, or Met.

<220>
<221> misc_feature
<222> (75)..(75)
<223> The 'Xaa' at location 75 stands for Asp, Gly, Ala, or Val.

<220>
<221> misc_feature
<222> (80)..(80)
<223> The 'Xaa' at location 80 stands for Thr, Ala, Pro, or Ser.

<220>
<221> misc_feature
<222> (82)..(82)
<223> The 'Xaa' at location 82 stands for Leu, or Phe.

<400> 4

Gly Arg Xaa Asp Xaa Val Ile Ser Ile Met Ala Leu Trp Pro Val Asp
1 5 10 15

Arg Phe Glu Arg Met Leu Glu Glu Pro Phe Xaa Arg Val Asp Arg Phe
20 25 30

Cys Pro Met Arg Asp Ala Asp Trp Met Ser Arg Gln Ile Met Pro Tyr
35 40 45

Trp Arg Asp Ala Asp His Ser Val Leu His Val Gly Asn Gln Thr Lys
50 55 60

Asp Val Val Asn Asp Glu Lys Lys Phe Ala Xaa Ala Leu Asp Val Xaa
65 70 75 80

His Xaa Arg Pro Glu Glu Leu Lys Val Gln Leu Glu Val Thr
85 90

<210> 5
<211> 583
<212> DNA
<213> Ostertagia ostertagi

<220>
<221> CDS
<222> (2)..(583)

<400> 5

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g gct ttt atc gga aaa ccc gca ccc gac ttc gcc aca aag gcc gtc tat      49
  Ala Phe Ile Gly Lys Pro Ala Pro Asp Phe Ala Thr Lys Ala Val Tyr
  1               5                   10                  15

aat ggc gac ttc atc gac gtg aaa ctg tct gac tac aag ggc aag tac      97
Asn Gly Asp Phe Ile Asp Val Lys Leu Ser Asp Tyr Lys Gly Lys Tyr
            20                  25                  30

acc gtc ctc ttc ttc tat cca ctg gat ttc acg ttt gtc tgt cct acg     145
Thr Val Leu Phe Phe Tyr Pro Leu Asp Phe Thr Phe Val Cys Pro Thr
        35                  40                  45

gaa atc atc gcc ttt tcc gac cgt gtc gaa gaa ttc aaa aaa atc gat     193
Glu Ile Ile Ala Phe Ser Asp Arg Val Glu Glu Phe Lys Lys Ile Asp
    50                  55                  60

gct gcg gtc ctc gct tgt tca amt gat tcc gtt ttc tct cat ctg gcg     241
Ala Ala Val Leu Ala Cys Ser Xaa Asp Ser Val Phe Ser His Leu Ala
65                  70                  75                  80

tgg atc aat act cct cgc aag atg ggc ggc ctt ggt gac atg aac att     289
Trp Ile Asn Thr Pro Arg Lys Met Gly Gly Leu Gly Asp Met Asn Ile
                85                  90                  95

ccc gtt ctt gct gac acc aac cac caa att gca aag gac tat ggt gta     337
Pro Val Leu Ala Asp Thr Asn His Gln Ile Ala Lys Asp Tyr Gly Val
            100                 105                 110

ctg aaa gaa gac gaa gga atc gct tac aga ggt ctt ttc att att gac     385
Leu Lys Glu Asp Glu Gly Ile Ala Tyr Arg Gly Leu Phe Ile Ile Asp
        115                 120                 125

cct aag gga att ctg cga cag atc act gtc aat gac ctt cct gtc ggt     433
Pro Lys Gly Ile Leu Arg Gln Ile Thr Val Asn Asp Leu Pro Val Gly
    130                 135                 140

cgc tct gtg gat gag act ctc cgt ctg gtg cag gcc ttc caa tac gtt     481
Arg Ser Val Asp Glu Thr Leu Arg Leu Val Gln Ala Phe Gln Tyr Val
145                 150                 155                 160

gac aag cat ggt gag gtg tgc cca gct ggt tgg act cct gga aaa gct     529
Asp Lys His Gly Glu Val Cys Pro Ala Gly Trp Thr Pro Gly Lys Ala
                165                 170                 175
```

```
acc atc aag cca ggt gtc aag gac agc aag gag tac ttc agc aaa gca      577
Thr Ile Lys Pro Gly Val Lys Asp Ser Lys Glu Tyr Phe Ser Lys Ala
            180                 185                 190

aac taa                                                              583
Asn
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<210> 6
<211> 193
<212> PRT
<213> Ostertagia ostertagi

<220>
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<222> (72)..(72)
<223> The 'Xaa' at location 72 stands for Asn, or Thr.

<400> 6

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Ala Phe Ile Gly Lys Pro Ala Pro Asp Phe Ala Thr Lys Ala Val Tyr
1               5                  10                  15

Asn Gly Asp Phe Ile Asp Val Lys Leu Ser Asp Tyr Lys Gly Lys Tyr
            20                  25                  30

Thr Val Leu Phe Phe Tyr Pro Leu Asp Phe Thr Phe Val Cys Pro Thr
        35                  40                  45

Glu Ile Ile Ala Phe Ser Asp Arg Val Glu Glu Phe Lys Lys Ile Asp
    50                  55                  60

Ala Ala Val Leu Ala Cys Ser Xaa Asp Ser Val Phe Ser His Leu Ala
65                  70                  75                  80

Trp Ile Asn Thr Pro Arg Lys Met Gly Gly Leu Gly Asp Met Asn Ile
                85                  90                  95

Pro Val Leu Ala Asp Thr Asn His Gln Ile Ala Lys Asp Tyr Gly Val
            100                 105                 110

Leu Lys Glu Asp Glu Gly Ile Ala Tyr Arg Gly Leu Phe Ile Ile Asp
        115                 120                 125

Pro Lys Gly Ile Leu Arg Gln Ile Thr Val Asn Asp Leu Pro Val Gly
    130                 135                 140

Arg Ser Val Asp Glu Thr Leu Arg Leu Val Gln Ala Phe Gln Tyr Val
145                 150                 155                 160
```

Asp Lys His Gly Glu Val Cys Pro Ala Gly Trp Thr Pro Gly Lys Ala
165 170 175

Thr Ile Lys Pro Gly Val Lys Asp Ser Lys Glu Tyr Phe Ser Lys Ala
180 185 190

Asn

<210> 7
<211> 693
<212> DNA
<213> Ostertagia ostertagi

<220>
<221> CDS
<222> (1)..(693)

<220>
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<222> (11)..(11)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (35)..(36)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (41)..(41)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (43)..(43)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (53)..(53)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (67)..(67)
<223> n is a, c, g, or t

<220>
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<222> (199)..(199)
<223> n is a, c, g, or t

<220>
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<222> (555)..(555)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (590)..(590)
<223> n is a, c, g, or t

<220>
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<222> (648)..(648)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (662)..(662)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (669)..(669)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (682)..(682)
<223> n is a, c, g, or t

<400> 7

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cta act cct tng cat cca acg cgt tgg gag ctc tnn cta tng ngg gaa        48
Leu Thr Pro Xaa His Pro Thr Arg Trp Glu Leu Xaa Leu Xaa Xaa Glu
1               5                  10                  15

ttg cna tgt ggt ggc gac nac tcc tgg agc ccg tca gta tcg gcg gaa        96
Leu Xaa Cys Gly Gly Asp Xaa Ser Trp Ser Pro Ser Val Ser Ala Glu
            20                  25                  30

ttc gcg gcc gcg tcg acc gtg ggt gtg gcc ctc gcg gtc cac caa aca       144
Phe Ala Ala Ala Ser Thr Val Gly Val Ala Leu Ala Val His Gln Thr
        35                  40                  45

ctt gac ctg ctt cct ctg aag cca cgc aag gag tac gtc ttc cgc ttt       192
Leu Asp Leu Leu Pro Leu Lys Pro Arg Lys Glu Tyr Val Phe Arg Phe
    50                  55                  60

gaa gga nat gtt cac tcc gga atc ccg ctc cca acc gac acc acc atc       240
Glu Gly Xaa Val His Ser Gly Ile Pro Leu Pro Thr Asp Thr Thr Ile
65                  70                  75                  80

tct cgc ata cag gct atg gta cat gtc cag atc cct gac gac cac cac       288
Ser Arg Ile Gln Ala Met Val His Val Gln Ile Pro Asp Asp His His
                85                  90                  95

gcc att ctc aag ctg aga gat gtt cgc ttt gct act gga gaa gac gaa       336
Ala Ile Leu Lys Leu Arg Asp Val Arg Phe Ala Thr Gly Glu Asp Glu
            100                 105                 110
```

```
cgc aga gaa ctc ttc aaa ccg atc gat gac ctg aaa atg cgc aca atc      384
Arg Arg Glu Leu Phe Lys Pro Ile Asp Asp Leu Lys Met Arg Thr Ile
        115                 120                 125

tca agg gag cac ctc gat ctc ctt gag ttg cca gtc cgt ttt gtc tac      432
Ser Arg Glu His Leu Asp Leu Leu Glu Leu Pro Val Arg Phe Val Tyr
    130                 135                 140

aag aac ggc atg att tcc gat gta atc ttt gtc gac aag gag gag acc      480
Lys Asn Gly Met Ile Ser Asp Val Ile Phe Val Asp Lys Glu Glu Thr
145                 150                 155                 160

tgg tcc cgc cag cgt gaa gcc gat ctg tca tca aca tgc tcc act tta      528
Trp Ser Arg Gln Arg Glu Ala Asp Leu Ser Ser Thr Cys Ser Thr Leu
                165                 170                 175

acc tcc aca aga tgg gac gaa ctg acn agc ttt aca atg gac agg tcc      576
Thr Ser Thr Arg Trp Asp Glu Leu Thr Ser Phe Thr Met Asp Arg Ser
            180                 185                 190

aag gtg gac ccg tng aca aac gag tac ttt cac tgg tta ccc gaa ccg      624
Lys Val Asp Pro Xaa Thr Asn Glu Tyr Phe His Trp Leu Pro Glu Pro
        195                 200                 205

aac cca ttc gaa ggg aaa ctt gtn aag gtt ggc tta cnc cgg ttn tta      672
Asn Pro Phe Glu Gly Lys Leu Val Lys Val Gly Leu Xaa Arg Xaa Leu
    210                 215                 220

aag aaa aaa ngg acc ttt tgg                                         693
Lys Lys Lys Xaa Thr Phe Trp
225                 230
```

<210> 8
<211> 231
<212> PRT
<213> Ostertagia ostertagi

<220>
<221> misc_feature
<222> (4)..(4)
<223> The 'Xaa' at location 4 stands for Trp, Ser, or Leu.

<220>
<221> misc_feature
<222> (12)..(12)
<223> The 'Xaa' at location 12 stands for Tyr, Trp, Cys, Ser, Leu, or Phe.

<220>
<221> misc_feature
<222> (14)..(14)
<223> The 'Xaa' at location 14 stands for Trp, Ser, or Leu.

<220>
<221> misc_feature
<222> (15)..(15)
<223> The 'Xaa' at location 15 stands for Arg, Gly, or Trp.

<220>
<221> misc_feature
<222> (18)..(18)
<223> The 'Xaa' at location 18 stands for Gln, Arg, Pro, or Leu.

<220>
<221> misc_feature
<222> (23)..(23)
<223> The 'Xaa' at location 23 stands for Asn, Asp, His, or Tyr.

<220>
<221> misc_feature
<222> (67)..(67)
<223> The 'Xaa' at location 67 stands for Asn, Asp, His, or Tyr.

<220>
<221> misc_feature
<222> (197)..(197)
<223> The 'Xaa' at location 197 stands for Trp, Ser, or Leu.

<220>
<221> misc_feature
<222> (221)..(221)
<223> The 'Xaa' at location 221 stands for His, Arg, Pro, or Leu.

<220>
<221> misc_feature
<222> (223)..(223)
<223> The 'Xaa' at location 223 stands for Leu, or Phe.

<220>
<221> misc_feature
<222> (228)..(228)
<223> The 'Xaa' at location 228 stands for Arg, Gly, or Trp.

<400> 8

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Leu Thr Pro Xaa His Pro Thr Arg Trp Glu Leu Xaa Leu Xaa Xaa Glu
1               5                  10                  15


Leu Xaa Cys Gly Gly Asp Xaa Ser Trp Ser Pro Ser Val Ser Ala Glu
            20                  25                  30

Phe Ala Ala Ala Ser Thr Val Gly Val Ala Leu Ala Val His Gln Thr
        35                  40                  45

Leu Asp Leu Leu Pro Leu Lys Pro Arg Lys Glu Tyr Val Phe Arg Phe
    50                  55                  60

Glu Gly Xaa Val His Ser Gly Ile Pro Leu Pro Thr Asp Thr Thr Ile
65                  70                  75                  80

Ser Arg Ile Gln Ala Met Val His Val Gln Ile Pro Asp Asp His His
                85                  90                  95
```

```
Ala Ile Leu Lys Leu Arg Asp Val Arg Phe Ala Thr Gly Glu Asp Glu
            100                 105                 110

Arg Arg Glu Leu Phe Lys Pro Ile Asp Asp Leu Lys Met Arg Thr Ile
        115                 120                 125

Ser Arg Glu His Leu Asp Leu Leu Glu Leu Pro Val Arg Phe Val Tyr
    130                 135                 140

Lys Asn Gly Met Ile Ser Asp Val Ile Phe Val Asp Lys Glu Glu Thr
145                 150                 155                 160

Trp Ser Arg Gln Arg Glu Ala Asp Leu Ser Ser Thr Cys Ser Thr Leu
                165                 170                 175

Thr Ser Thr Arg Trp Asp Glu Leu Thr Ser Phe Thr Met Asp Arg Ser
            180                 185                 190

Lys Val Asp Pro Xaa Thr Asn Glu Tyr Phe His Trp Leu Pro Glu Pro
        195                 200                 205

Asn Pro Phe Glu Gly Lys Leu Val Lys Val Gly Leu Xaa Arg Xaa Leu
    210                 215                 220

Lys Lys Lys Xaa Thr Phe Trp
225                 230
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<210> 9
<211> 763
<212> DNA
<213> Ostertagia ostertagi

<220>
<221> CDS
<222> (11)..(706)

<400> 9

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gagaactgct atg tcg gcg gct gtt gta gtt gct gtt ctc ctg gcc ctg        49
          Met Ser Ala Ala Val Val Val Ala Val Leu Leu Ala Leu
          1               5                   10

ttc tcc tat gcc gaa gca ggc ttt tgt tgt ccg aat agt cta agc caa        97
Phe Ser Tyr Ala Glu Ala Gly Phe Cys Cys Pro Asn Ser Leu Ser Gln
    15                  20                  25

agt gac agc gcg agg cag att ttc ctc gat ttt cac aat gat gtt cgt       145
Ser Asp Ser Ala Arg Gln Ile Phe Leu Asp Phe His Asn Asp Val Arg
30                  35                  40                  45
```

```
cga aat ata gca ctt gga aat ggt ttg ata aac tgg aca gta aat gca      193
Arg Asn Ile Ala Leu Gly Asn Gly Leu Ile Asn Trp Thr Val Asn Ala
                50                  55                  60

gac gcg gtc att ctt ggt cca gct cag aac atg tac aaa gtg gac tgg      241
Asp Ala Val Ile Leu Gly Pro Ala Gln Asn Met Tyr Lys Val Asp Trp
            65                  70                  75

gat tgc aac ttg gaa gaa gta gca gca caa cag att gcg cca tgc aat      289
Asp Cys Asn Leu Glu Glu Val Ala Ala Gln Gln Ile Ala Pro Cys Asn
        80                  85                  90

gat ccc cta ccg ata aat acc agc ctg gct caa aat atc gct aga tgg      337
Asp Pro Leu Pro Ile Asn Thr Ser Leu Ala Gln Asn Ile Ala Arg Trp
    95                  100                 105

ctg tac ttc aaa gac agt gaa gaa gag aca gtt ctg caa caa gta tcg      385
Leu Tyr Phe Lys Asp Ser Glu Glu Glu Thr Val Leu Gln Gln Val Ser
110                 115                 120                 125

tgg tat tgg gtg agc gca tcg ctg gga ttt atg aaa ggc acg aaa ctt      433
Trp Tyr Trp Val Ser Ala Ser Leu Gly Phe Met Lys Gly Thr Lys Leu
                130                 135                 140

gac caa ttt gct aac cag tgg gct gaa cct cta gca aac att gca aac      481
Asp Gln Phe Ala Asn Gln Trp Ala Glu Pro Leu Ala Asn Ile Ala Asn
            145                 150                 155

tat aga aac cga aag gtt gga tgt gcc cat aag atc tgc ccc gct cag      529
Tyr Arg Asn Arg Lys Val Gly Cys Ala His Lys Ile Cys Pro Ala Gln
        160                 165                 170

caa aac atg gta gta tcc tgc gtg tat gga agc ccc aaa ctt gca ccg      577
Gln Asn Met Val Val Ser Cys Val Tyr Gly Ser Pro Lys Leu Ala Pro
    175                 180                 185

aac gaa gtt atc tgg cag gaa gga aag gct tgt gtg tgc gac gct cgt      625
Asn Glu Val Ile Trp Gln Glu Gly Lys Ala Cys Val Cys Asp Ala Arg
190                 195                 200                 205

cca gat tca ttc tgc tgc gac aac ctg tgt gac acg cga gat gct gcg      673
Pro Asp Ser Phe Cys Cys Asp Asn Leu Cys Asp Thr Arg Asp Ala Ala
                210                 215                 220

agt gtt cgc cac cag tgt tgc gcg tcg cca tga agcgaaaaga aattggtagt    726
Ser Val Arg His Gln Cys Cys Ala Ser Pro
            225                 230

caccccgaat aaaatattca tgcaaaaaaa aaaaaaa                            763
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<210> 10
<211> 231
<212> PRT
<213> Ostertagia ostertagi

<400> 10

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Met Ser Ala Ala Val Val Val Ala Val Leu Leu Ala Leu Phe Ser Tyr
1               5                   10                  15
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```
Ala Glu Ala Gly Phe Cys Cys Pro Asn Ser Leu Ser Gln Ser Asp Ser
            20                  25                  30

Ala Arg Gln Ile Phe Leu Asp Phe His Asn Asp Val Arg Arg Asn Ile
        35                  40                  45

Ala Leu Gly Asn Gly Leu Ile Asn Trp Thr Val Asn Ala Asp Ala Val
    50                  55                  60

Ile Leu Gly Pro Ala Gln Asn Met Tyr Lys Val Asp Trp Asp Cys Asn
65                  70                  75                  80

Leu Glu Glu Val Ala Ala Gln Gln Ile Ala Pro Cys Asn Asp Pro Leu
                85                  90                  95

Pro Ile Asn Thr Ser Leu Ala Gln Asn Ile Ala Arg Trp Leu Tyr Phe
            100                 105                 110

Lys Asp Ser Glu Glu Glu Thr Val Leu Gln Gln Val Ser Trp Tyr Trp
        115                 120                 125

Val Ser Ala Ser Leu Gly Phe Met Lys Gly Thr Lys Leu Asp Gln Phe
    130                 135                 140

Ala Asn Gln Trp Ala Glu Pro Leu Ala Asn Ile Ala Asn Tyr Arg Asn
145                 150                 155                 160

Arg Lys Val Gly Cys Ala His Lys Ile Cys Pro Ala Gln Gln Asn Met
                165                 170                 175

Val Val Ser Cys Val Tyr Gly Ser Pro Lys Leu Ala Pro Asn Glu Val
            180                 185                 190

Ile Trp Gln Glu Gly Lys Ala Cys Val Cys Asp Ala Arg Pro Asp Ser
        195                 200                 205

Phe Cys Cys Asp Asn Leu Cys Asp Thr Arg Asp Ala Ala Ser Val Arg
    210                 215                 220

His Gln Cys Cys Ala Ser Pro
225                 230
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<210> 11
<211> 893
<212> DNA
<213> Ostertagia ostertagi

<220>
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<222> (1)..(684)

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<222> (813)..(813)
<223> n is a, c, g, or t

<220>
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<222> (858)..(858)
<223> n is a, c, g, or t

<400> 11

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atg aag ttg gtc gtg ctc tgc gtt ctg tgt gga atc gct ctt gct gcc        48
Met Lys Leu Val Val Leu Cys Val Leu Cys Gly Ile Ala Leu Ala Ala
1               5                  10                  15

ccg aga cag aaa cgc ctt act gtg ggc acg atc gct gtc acc gga gga        96
Pro Arg Gln Lys Arg Leu Thr Val Gly Thr Ile Ala Val Thr Gly Gly
            20                  25                  30

gtc ggc gga tcc acg ggg tgt gta gtg act gga aat gtc ctc tac gca       144
Val Gly Gly Ser Thr Gly Cys Val Val Thr Gly Asn Val Leu Tyr Ala
        35                  40                  45

aac ggt ttc cgc ctt cgt gaa ctc aac cca tcg gag cag caa gaa ctc       192
Asn Gly Phe Arg Leu Arg Glu Leu Asn Pro Ser Glu Gln Gln Glu Leu
    50                  55                  60

gta aac tat gag aag cag gtg gcc gac tac aaa gcg gct gtg aag caa       240
Val Asn Tyr Glu Lys Gln Val Ala Asp Tyr Lys Ala Ala Val Lys Gln
65                  70                  75                  80

gcc ctc aag gaa cgc cag gaa agc ctg aaa tcg cgc atg gct ggt aag       288
Ala Leu Lys Glu Arg Gln Glu Ser Leu Lys Ser Arg Met Ala Gly Lys
                85                  90                  95

aag gag aag gct gtg act ccc aag gag gaa gat cta ccc aaa gct cca       336
Lys Glu Lys Ala Val Thr Pro Lys Glu Glu Asp Leu Pro Lys Ala Pro
            100                 105                 110

cag aag ccc tca ttc tgc act gag gac gac acc acc cag ttc tac ttt       384
Gln Lys Pro Ser Phe Cys Thr Glu Asp Asp Thr Thr Gln Phe Tyr Phe
        115                 120                 125

gat gga tgc atg gtt cag ggc aac aag gtc tac gtt ggc aac aca ttc       432
Asp Gly Cys Met Val Gln Gly Asn Lys Val Tyr Val Gly Asn Thr Phe
    130                 135                 140

gcg cgc gat ttg gac cag aac gag att caa gag ctg aag gag ttt gag       480
Ala Arg Asp Leu Asp Gln Asn Glu Ile Gln Glu Leu Lys Glu Phe Glu
145                 150                 155                 160
```

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aag aag cag act gtc tac cag gaa tac gtc cag aag cag att caa gcg      528
Lys Lys Gln Thr Val Tyr Gln Glu Tyr Val Gln Lys Gln Ile Gln Ala
                165                 170                 175

caa gtg agc aat ctg ttc ggc ggt gcc gac ttc ttt tca tcg ttc ttc      576
Gln Val Ser Asn Leu Phe Gly Gly Ala Asp Phe Phe Ser Ser Phe Phe
            180                 185                 190

aac ggc gga tct gag aaa ggc tct tca acc acc act gtg gcc cca gtg      624
Asn Gly Gly Ser Glu Lys Gly Ser Ser Thr Thr Thr Val Ala Pro Val
        195                 200                 205

ctt cct gaa gat gca cca gaa caa cca gct ggg ccc aac ttt tgc aca      672
Leu Pro Glu Asp Ala Pro Glu Gln Pro Ala Gly Pro Asn Phe Cys Thr
    210                 215                 220

agg atc tat tga tggggtattt ttatgatgac aaagtattta ataaaatgca         724
Arg Ile Tyr
225

gtagttgcct gttgctgtga attccacagc actcctactc acggtgtcga ctggtgattt   784

agtcacttta tttgcaatat tttttatgng ttaccgcaat tcgttgtata tttgtgttat   844

aaacattaac atcnaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaa              893
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<210> 12
<211> 227
<212> PRT
<213> Ostertagia ostertagi

<400> 12

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Met Lys Leu Val Val Leu Cys Val Leu Cys Gly Ile Ala Leu Ala Ala
1               5                  10                  15

Pro Arg Gln Lys Arg Leu Thr Val Gly Thr Ile Ala Val Thr Gly Gly
            20                  25                  30

Val Gly Gly Ser Thr Gly Cys Val Val Thr Gly Asn Val Leu Tyr Ala
        35                  40                  45

Asn Gly Phe Arg Leu Arg Glu Leu Asn Pro Ser Glu Gln Gln Glu Leu
    50                  55                  60

Val Asn Tyr Glu Lys Gln Val Ala Asp Tyr Lys Ala Ala Val Lys Gln
65                  70                  75                  80

Ala Leu Lys Glu Arg Gln Glu Ser Leu Lys Ser Arg Met Ala Gly Lys
                85                  90                  95
```

Lys Glu Lys Ala Val Thr Pro Lys Glu Glu Asp Leu Pro Lys Ala Pro
100 105 110

Gln Lys Pro Ser Phe Cys Thr Glu Asp Asp Thr Thr Gln Phe Tyr Phe
115 120 125

Asp Gly Cys Met Val Gln Gly Asn Lys Val Tyr Val Gly Asn Thr Phe
130 135 140

Ala Arg Asp Leu Asp Gln Asn Glu Ile Gln Glu Leu Lys Glu Phe Glu
145 150 155 160

Lys Lys Gln Thr Val Tyr Gln Glu Tyr Val Gln Lys Gln Ile Gln Ala
165 170 175

Gln Val Ser Asn Leu Phe Gly Gly Ala Asp Phe Phe Ser Ser Phe Phe
180 185 190

Asn Gly Gly Ser Glu Lys Gly Ser Ser Thr Thr Thr Val Ala Pro Val
195 200 205

Leu Pro Glu Asp Ala Pro Glu Gln Pro Ala Gly Pro Asn Phe Cys Thr
210 215 220

Arg Ile Tyr
225

<210> 13
<211> 1761
<212> DNA
<213> Ostertagia ostertagi

<220>
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<222> (1)..(1725)

<400> 13
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Met Arg Leu Ile Leu Leu Ile Leu Leu Leu Val Val Ala Thr Asn Gly
1 5 10 15

ggc ata att gac aaa ctg aaa gga ttg ttc act gga gaa ggc ggc ttt 96
Gly Ile Ile Asp Lys Leu Lys Gly Leu Phe Thr Gly Glu Gly Gly Phe
20 25 30

gga caa aaa gtg aag aat gca act gct gtt ggc ttc aaa aag ctc ttc 144
Gly Gln Lys Val Lys Asn Ala Thr Ala Val Gly Phe Lys Lys Leu Phe
35 40 45

```
gaa aac acg gca ctc ttc aga atc aat gat aag atc agg agc atg aag      192
Glu Asn Thr Ala Leu Phe Arg Ile Asn Asp Lys Ile Arg Ser Met Lys
    50                  55                  60

gaa aaa gtg ttg aag acc ttg gaa cta tca cca gca atg atg aag tca      240
Glu Lys Val Leu Lys Thr Leu Glu Leu Ser Pro Ala Met Met Lys Ser
65                  70                  75                  80

ctg caa kmg agg cta rwg aaw tsg cgr cck yct rma grw cga yma wrt      288
Leu Gln Xaa Arg Leu Xaa Xaa Xaa Arg Xaa Xaa Xaa Xaa Arg Xaa Xaa
                85                  90                  95

rsr mga gmt sss aga crc gtw kka ygc rag gtc art aaa aat agt gag      336
Xaa Xaa Xaa Xaa Arg Xaa Xaa Xaa Xaa Xaa Val Xaa Lys Asn Ser Glu
            100                 105                 110

gtt gac caa tac ctc tac caa ggc gac atg gtt tta aca gag gag caa      384
Val Asp Gln Tyr Leu Tyr Gln Gly Asp Met Val Leu Thr Glu Glu Gln
        115                 120                 125

gcc gat gag atc gtt gag gac ata gaa gat cag gtc gcc ggt gga aat      432
Ala Asp Glu Ile Val Glu Asp Ile Glu Asp Gln Val Ala Gly Gly Asn
    130                 135                 140

cgt aca aaa cgt caa gca ttc aag gat cat aaa tat ccc aaa acg ttg      480
Arg Thr Lys Arg Gln Ala Phe Lys Asp His Lys Tyr Pro Lys Thr Leu
145                 150                 155                 160

tgg tca caa gga gtc aac tac tac ttc cat gat atg gcc agt aag cag      528
Trp Ser Gln Gly Val Asn Tyr Tyr Phe His Asp Met Ala Ser Lys Gln
                165                 170                 175

atg aaa agc gta ttc gta aaa gga gcg aaa tgg tgg gaa aag gac acg      576
Met Lys Ser Val Phe Val Lys Gly Ala Lys Trp Trp Glu Lys Asp Thr
            180                 185                 190

tgt atc aat ttc acg gag aac cgt tct gcc gaa gac cga att atg gta      624
Cys Ile Asn Phe Thr Glu Asn Arg Ser Ala Glu Asp Arg Ile Met Val
        195                 200                 205

ttc cca cag aaa gga tgt tgg tca aat ata gga aaa atc ggt ggc gaa      672
Phe Pro Gln Lys Gly Cys Trp Ser Asn Ile Gly Lys Ile Gly Gly Glu
    210                 215                 220

caa aag att tcg ttg gga gga ggt tgt cat tcg gta tcc att gct gcg      720
Gln Lys Ile Ser Leu Gly Gly Gly Cys His Ser Val Ser Ile Ala Ala
225                 230                 235                 240

cat gag atc ggt cac gca att gga ttc ttc cat act atg tcc cgt cac      768
His Glu Ile Gly His Ala Ile Gly Phe Phe His Thr Met Ser Arg His
                245                 250                 255

gat cgc gat gaa ttc atc acc gta aac atg cac aat gtt gat gta cac      816
Asp Arg Asp Glu Phe Ile Thr Val Asn Met His Asn Val Asp Val His
            260                 265                 270

tgg ctg agt caa ttt aat aaa gaa acg acg aag aga aat gat aat tat      864
Trp Leu Ser Gln Phe Asn Lys Glu Thr Thr Lys Arg Asn Asp Asn Tyr
        275                 280                 285
```

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gga atg acg tac gac tac ggt agc att atg cat tac ggt gga acc agt      912
Gly Met Thr Tyr Asp Tyr Gly Ser Ile Met His Tyr Gly Gly Thr Ser
    290                 295                 300

gca tcg tac aat aat aag cca aca atg gtg ccg ttt gat gtg gac tat      960
Ala Ser Tyr Asn Asn Lys Pro Thr Met Val Pro Phe Asp Val Asp Tyr
305                 310                 315                 320

cag caa acc ctt ggc tct cca ttc att tct ttc att gaa ctt tcc atg     1008
Gln Gln Thr Leu Gly Ser Pro Phe Ile Ser Phe Ile Glu Leu Ser Met
                325                 330                 335

att aat gaa cac tac aaa tgc aaa gag aac tgc aat cca gct aag tcg     1056
Ile Asn Glu His Tyr Lys Cys Lys Glu Asn Cys Asn Pro Ala Lys Ser
            340                 345                 350

gct aaa tgc gaa atg ggc gga ttc cct cat ccc cga gac tgc agc aaa     1104
Ala Lys Cys Glu Met Gly Gly Phe Pro His Pro Arg Asp Cys Ser Lys
        355                 360                 365

tgt atc tgt cct ggt gga tac gcc gga gct cga tgc acc gaa aga cca     1152
Cys Ile Cys Pro Gly Gly Tyr Ala Gly Ala Arg Cys Thr Glu Arg Pro
    370                 375                 380

tca ggg tgt ggc agt gca att caa gct tcg tcc gat tgg aag acc tta     1200
Ser Gly Cys Gly Ser Ala Ile Gln Ala Ser Ser Asp Trp Lys Thr Leu
385                 390                 395                 400

caa gat acc ctt ggc aag gat gat gat gaa gaa cga gag gac ttc gag     1248
Gln Asp Thr Leu Gly Lys Asp Asp Asp Glu Glu Arg Glu Asp Phe Glu
                405                 410                 415

aca tgt aat tac tgg att gaa tct cct gcc gga acm gaa atc gaa gtg     1296
Thr Cys Asn Tyr Trp Ile Glu Ser Pro Ala Gly Xaa Glu Ile Glu Val
            420                 425                 430

agg tta ttg gat ttc acg agg ggt gtt tct gtc gat gga tgc aaa ttt     1344
Arg Leu Leu Asp Phe Thr Arg Gly Val Ser Val Asp Gly Cys Lys Phe
        435                 440                 445

gcc ggt gta gag atc aag acc aat aag gat caa aca ctc act ggc tac     1392
Ala Gly Val Glu Ile Lys Thr Asn Lys Asp Gln Thr Leu Thr Gly Tyr
    450                 455                 460

agg ttc tgc aca gct ggc gca gct ggc ata gca ctt cgt tct tac acg     1440
Arg Phe Cys Thr Ala Gly Ala Ala Gly Ile Ala Leu Arg Ser Tyr Thr
465                 470                 475                 480

aat cgc gtc cca ata atg aca tac aac aga ttt ggt caa tcg acg act     1488
Asn Arg Val Pro Ile Met Thr Tyr Asn Arg Phe Gly Gln Ser Thr Thr
                485                 490                 495

gtt ctc gaa tac cga cac gtt ccg gcg agt gcg cca aga acg ccc tca     1536
Val Leu Glu Tyr Arg His Val Pro Ala Ser Ala Pro Arg Thr Pro Ser
            500                 505                 510

cct cca tct gct aca act cgt gct tct att act act act act act acg     1584
Pro Pro Ser Ala Thr Thr Arg Ala Ser Ile Thr Thr Thr Thr Thr Thr
        515                 520                 525
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aag aaa ccc agc tct act gct gcc ttt aaa tgc gag gac aac cac act      1632
Lys Lys Pro Ser Ser Thr Ala Ala Phe Lys Cys Glu Asp Asn His Thr
    530                 535                 540

tgt ccc tca ctt gta gcg agc ggt ttc tgc aaa ggg cca ctc tca gag      1680
Cys Pro Ser Leu Val Ala Ser Gly Phe Cys Lys Gly Pro Leu Ser Glu
545                 550                 555                 560

gct acc aag aag aaa gtg tgt cca aag tcg tgt gga ctc tgc tga          1725
Ala Thr Lys Lys Lys Val Cys Pro Lys Ser Cys Gly Leu Cys
                565                 570

tacaacactt tctctgtaat aaaatctgaa caattc                             1761
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<210> 14
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<212> PRT
<213> Ostertagia ostertagi

<220>
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<222> (83)..(83)
<223> The 'Xaa' at location 83 stands for Glu, Ala, or Ser.

<220>
<221> misc_feature
<222> (86)..(86)
<223> The 'Xaa' at location 86 stands for Glu, Val, Lys, or Met.

<220>
<221> misc_feature
<222> (87)..(87)
<223> The 'Xaa' at location 87 stands for Lys, or Asn.

<220>
<221> misc_feature
<222> (88)..(88)
<223> The 'Xaa' at location 88 stands for Trp, or Ser.

<220>
<221> misc_feature
<222> (90)..(90)
<223> The 'Xaa' at location 90 stands for Pro.

<220>
<221> misc_feature
<222> (91)..(91)
<223> The 'Xaa' at location 91 stands for Pro, or Ser.

<220>
<221> misc_feature
<222> (92)..(92)
<223> The 'Xaa' at location 92 stands for Glu, Ala, Lys, or Thr.

<220>
<221> misc_feature
<222> (93)..(93)
<223> The 'Xaa' at location 93 stands for Gly, Glu, or Asp.

<220>
<221> misc_feature
<222> (95)..(95)
<223> The 'Xaa' at location 95 stands for Gln, Pro, or Ser.

<220>
<221> misc_feature
<222> (96)..(96)
<223> The 'Xaa' at location 96 stands for Ser, Asn, Cys, or Tyr.

<220>
<221> misc_feature
<222> (97)..(97)
<223> The 'Xaa' at location 97 stands for Gly, Ala, Arg, or Thr.

<220>
<221> misc_feature
<222> (98)..(98)
<223> The 'Xaa' at location 98 stands for Arg.

<220>
<221> misc_feature
<222> (99)..(99)
<223> The 'Xaa' at location 99 stands for Asp, or Ala.

<220>
<221> misc_feature
<222> (100)..(100)
<223> The 'Xaa' at location 100 stands for Gly, Ala, Arg, or Pro.

<220>
<221> misc_feature
<222> (102)..(102)
<223> The 'Xaa' at location 102 stands for Arg, or His.

<220>
<221> misc_feature
<222> (103)..(103)
<223> The 'Xaa' at location 103 stands for Val.

<220>
<221> misc_feature
<222> (104)..(104)
<223> The 'Xaa' at location 104 stands for Gly, Val, or Leu.

<220>
<221> misc_feature
<222> (105)..(105)
<223> The 'Xaa' at location 105 stands for Arg, or Cys.

<220>
<221> misc_feature
<222> (106)..(106)
<223> The 'Xaa' at location 106 stands for Glu, or Lys.

<220>
<221> misc_feature
<222> (108)..(108)
<223> The 'Xaa' at location 108 stands for Ser, or Asn.

<220>
<221> misc_feature
<222> (428)..(428)
<223> The 'Xaa' at location 428 stands for Thr.

<400> 14

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Met Arg Leu Ile Leu Leu Ile Leu Leu Leu Val Val Ala Thr Asn Gly
1               5                  10                  15

Gly Ile Ile Asp Lys Leu Lys Gly Leu Phe Thr Gly Glu Gly Gly Phe
            20                  25                  30

Gly Gln Lys Val Lys Asn Ala Thr Ala Val Gly Phe Lys Lys Leu Phe
        35                  40                  45

Glu Asn Thr Ala Leu Phe Arg Ile Asn Asp Lys Ile Arg Ser Met Lys
    50                  55                  60

Glu Lys Val Leu Lys Thr Leu Glu Leu Ser Pro Ala Met Met Lys Ser
65                  70                  75                  80

Leu Gln Xaa Arg Leu Xaa Xaa Xaa Arg Xaa Xaa Xaa Xaa Arg Xaa Xaa
                85                  90                  95

Xaa Xaa Xaa Xaa Arg Xaa Xaa Xaa Xaa Xaa Val Xaa Lys Asn Ser Glu
            100                 105                 110

Val Asp Gln Tyr Leu Tyr Gln Gly Asp Met Val Leu Thr Glu Glu Gln
        115                 120                 125

Ala Asp Glu Ile Val Glu Asp Ile Glu Asp Gln Val Ala Gly Gly Asn
    130                 135                 140

Arg Thr Lys Arg Gln Ala Phe Lys Asp His Lys Tyr Pro Lys Thr Leu
145                 150                 155                 160

Trp Ser Gln Gly Val Asn Tyr Tyr Phe His Asp Met Ala Ser Lys Gln
                165                 170                 175

Met Lys Ser Val Phe Val Lys Gly Ala Lys Trp Trp Glu Lys Asp Thr
            180                 185                 190

Cys Ile Asn Phe Thr Glu Asn Arg Ser Ala Glu Asp Arg Ile Met Val
        195                 200                 205
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Phe Pro Gln Lys Gly Cys Trp Ser Asn Ile Gly Lys Ile Gly Gly Glu
210 215 220

Gln Lys Ile Ser Leu Gly Gly Gly Cys His Ser Val Ser Ile Ala Ala
225 230 235 240

His Glu Ile Gly His Ala Ile Gly Phe Phe His Thr Met Ser Arg His
245 250 255

Asp Arg Asp Glu Phe Ile Thr Val Asn Met His Asn Val Asp Val His
260 265 270

Trp Leu Ser Gln Phe Asn Lys Glu Thr Thr Lys Arg Asn Asp Asn Tyr
275 280 285

Gly Met Thr Tyr Asp Tyr Gly Ser Ile Met His Tyr Gly Gly Thr Ser
290 295 300

Ala Ser Tyr Asn Asn Lys Pro Thr Met Val Pro Phe Asp Val Asp Tyr
305 310 315 320

Gln Gln Thr Leu Gly Ser Pro Phe Ile Ser Phe Ile Glu Leu Ser Met
325 330 335

Ile Asn Glu His Tyr Lys Cys Lys Glu Asn Cys Asn Pro Ala Lys Ser
340 345 350

Ala Lys Cys Glu Met Gly Gly Phe Pro His Pro Arg Asp Cys Ser Lys
355 360 365

Cys Ile Cys Pro Gly Gly Tyr Ala Gly Ala Arg Cys Thr Glu Arg Pro
370 375 380

Ser Gly Cys Gly Ser Ala Ile Gln Ala Ser Ser Asp Trp Lys Thr Leu
385 390 395 400

Gln Asp Thr Leu Gly Lys Asp Asp Asp Glu Glu Arg Glu Asp Phe Glu
405 410 415

Thr Cys Asn Tyr Trp Ile Glu Ser Pro Ala Gly Xaa Glu Ile Glu Val
420 425 430

Arg Leu Leu Asp Phe Thr Arg Gly Val Ser Val Asp Gly Cys Lys Phe
435 440 445

Ala Gly Val Glu Ile Lys Thr Asn Lys Asp Gln Thr Leu Thr Gly Tyr
450 455 460

Arg Phe Cys Thr Ala Gly Ala Ala Gly Ile Ala Leu Arg Ser Tyr Thr
465 470 475 480

Asn Arg Val Pro Ile Met Thr Tyr Asn Arg Phe Gly Gln Ser Thr Thr
485 490 495

Val Leu Glu Tyr Arg His Val Pro Ala Ser Ala Pro Arg Thr Pro Ser
500 505 510

Pro Pro Ser Ala Thr Thr Arg Ala Ser Ile Thr Thr Thr Thr Thr Thr
515 520 525

Lys Lys Pro Ser Ser Thr Ala Ala Phe Lys Cys Glu Asp Asn His Thr
530 535 540

Cys Pro Ser Leu Val Ala Ser Gly Phe Cys Lys Gly Pro Leu Ser Glu
545 550 555 560

Ala Thr Lys Lys Lys Val Cys Pro Lys Ser Cys Gly Leu Cys
565 570

<210> 15
<211> 24
<212> DNA
<213> Artificial

<220>
<223> primer: Lambdagt11F

<220>
<221> misc_feature
<223> Lambdagt11F

<400> 15
ggtggcgacg actcctggag cccg 24

<210> 16
<211> 24
<212> DNA
<213> Artificial

<220>
<223> primer: Lambdagt11R

<400> 16
ttgacaccag accaactggt aatg 24

<210> 17
<211> 20
<212> DNA
<213> Artificial

<220>
<223> primer: SP6

<400> 17
atttaggtga cactatagaa 20

<210> 18
<211> 22
<212> DNA
<213> Artificial

<220>
<223> primer: T7

<400> 18
gtaatacgac tcactatagg gc 22

<210> 19
<211> 21
<212> DNA
<213> Artificial

<220>
<223> primer: 24kForw

<400> 19
gaattcatga agttggtcgt g 21

<210> 20
<211> 22
<212> DNA
<213> Artificial

<220>
<223> primer: 24kRev

<400> 20
ctcgagtcaa tagatccttg tg 22

<210> 21
<211> 36
<212> DNA
<213> Artificial

<220>
<223> primer: AAP

<220>
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<222> (24)..(25)
<223> n = Inosine

<220>
<221> misc_feature
<222> (29)..(30)
<223> n = Inosine

<220>
<221> misc_feature
<222> (34)..(35)
<223> n = Inosine

<400> 21
ggccacgcgt cgactagtac gggnngggnn gggnng 36

<210> 22
<211> 32
<212> DNA
<213> Artificial

<220>
<223> primer: UAP

<400> 22
cuacuacuac uaggccacgc gtcgactagt ac 32

<210> 23
<211> 21
<212> DNA
<213> Artificial

<220>
<223> primer: 65Rev1

<400> 23
cagcaatgga taccgaatga c 21

<210> 24
<211> 22
<212> DNA
<213> Artificial

<220>
<223> primer: 65Rev2

<400> 24
agtgacttca tcattgctgg tg 22

<210> 25
<211> 21
<212> DNA
<213> Artificial

<220>
<223> primer: 65kForw

<400> 25
tgatgatgaa gaacgagagg a 21

<210> 26
<211> 30
<212> DNA
<213> Artificial

<220>
<223> primer: For65

<400> 26
ggatccatga ggctgatatt gctcatttta 30

<210> 27
<211> 27
<212> DNA
<213> Artificial

<220>
<223> primer: Rev65

<400> 27
ctcgaggcag agtccacacg actttgg 27